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Remarks

Claims 1, 3-15, and 17-31 were pending prior to this Response. By the present communication, claims 1 and 17 have been amended to define the claims with greater particularity, no claims have been canceled, and new claim 32 has been added. Support for the amendments may be found throughout the specification and claims as originally filed e.g., at least at paragraphs [0035]-[0037], [0042], [0046], and [0051]; and Figure 1 and throughout the specification and claims as originally filed. No new matter has been added. Accordingly, upon entry of the present amendment, claims 1, 3-15, and 17-32 will be pending and under consideration in this application.

Rejections under 35 U.S.C §112, second paragraph

Applicants respectfully traverse the rejection of claim 17 under 35 U.S.C. §112, second paragraph, as allegedly being indefinite. In particular the Office Action asserts that it is unclear which instance of electrical potential claim 17 is intended to reference as claim 15, from which claim 17 depends, recites two sources of electrical potential. Without acquiescing to the reasoning provided by the Office Action, and in order to expedite prosecution, Applicants have amended claim 17 to recite “the source of electrical potential in b).” Accordingly, withdrawal of the rejection is respectfully requested.

Rejections under 35 U.S.C. § 103(a)

Applicants respectfully traverse the rejection of claims 1, 4-11, 13-15, 18-20, and 27-31 under 35 U.S.C. §103(a) as allegedly obvious over Bryner et al. (U.S. Patent No. 7,585,451 B2; hereinafter “Bryner”).

The U.S. Supreme Court decision in *KSR International v. Teleflex Inc.* (82 USPQ 2d 1385), modified the standard for establishing a *prima facie* case of obviousness. Under the *KSR* rule, three basic criteria are considered. First, some suggestion or motivation to modify a reference or to combine the teachings of multiple references still has to be shown. Second, the

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combination has to suggest a reasonable expectation of success. Third, the prior art reference or combination has to teach or suggest all of the recited claim limitations. Factors such as the general state of the art and common sense may be considered when determining the feasibility of modifying and/or combining references.

The new Guidelines establishing standards for obviousness emphasize that Examiners “must provide a reasoned explanation as to why the invention as claimed would have been obvious,” and are equally clear that “familiar lines of argument,” e.g., a showing of unexpected results, a lack of reasonable expectation of success, and a teaching away from the claimed invention by the prior art, can still demonstrate the non-obviousness of a claimed invention. Applicants submit that the Examiner has not met this burden for the reasons discussed below.

The Office Action (page 5, Office Action) alleges that Bryner discloses a method and apparatus capable of containing materials recited in instant claims 4-10 for fabricating oriented polymers, pointing to Figure 2 of the document in support of its position and concludes (page 6, Office Action) “since Bryner’s method and apparatus meet all of the limitations of Claim 15, the Examiner considers that Bryner’s fibers would be oriented, owing at least in part to the applied electric field.”

As an initial matter, Applicants submit that Bryner discloses a method and apparatus for producing a *fibrous* web of polymer(s). Nowhere does Bryner remotely suggest an apparatus or method for producing *oriented* polymer fibers. The Office is aware of the distinction between the oriented (aligned) fibers of instant claims and the fibrous webs of Bryner. The mere fact that the disclosure of Bryner *can* be modified, or that the skilled artisan is *capable* of modifying the elements of Bryner, in some manner does not establish a motivation or suggestion to perform the alterations making the resultant modification *prima facie* obvious. Because Bryner does not suggest the desirability of any sort of modification to produce the three-dimensional oriented polymers of the instant claims, Applicants submit that a case of *prima facie* obviousness has not been established.

With regard to the Office Action’s assertion “that Bryner’s fibers would be oriented, owing at least in part to the applied electric field,” Applicants respectfully disagree for the

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following reasons and submit that this feature is not well-known or supported by common knowledge in the art (see M.P.E.P §2144.03 C).

The method and the apparatus of Bryner include (page 1, paragraph [0013]) “a polymer stream comprising a polymer and a solvent, or a polymer melt, is fed from a storage tank, or in the case of a polymer melt from an extruder **100** to a spinning nozzle **104** (also referred to as a “die”) located in a spinneret **102** through which the polymer stream is discharged. The *polymer stream passes through an electric field generated between spinneret 102 and electrodes 140 and 142 as it is discharged from the spinneret 102.*” (emphasis added).

Thus, the method and apparatus of Bryner employ an external electric field applied to a neutral polymer fluid *after* it is dispensed from a reservoir and a charge subsequently develops at the fluid’s free surface (see Bryner paragraph [0016], page 1 and paragraph [0006], which describes a “process for forming a fibrous web comprising issuing an electrically charged polymer stream from a spinning nozzle in a spinneret, passing the stream by an electrode, which is substantially grounded, wherein a voltage is applied to the spinneret such that *an electric field is generated between the spinneret and the electrode of sufficient strength to impart said electrical charge to the polymer stream as it issues from the spinning nozzle.*” (emphasis added). It is the external electric field of Bryner that exerts a force on the polymer dispersion (see Bryner at paragraph [0015], page 1), which is then passed by an electrode; however, the field leads to a polymer stream that bends and stretches leading to randomly oriented polymer fibers.

Bryner states at paragraph [0016], on pages 2 “[i]t is believed that the *electric field combined with the charge on the polymer stream provides spreading forces* which act on the fibers and fibrils formed therein, *causing the web to be better dispersed* and providing for very uniform web laydown on the collection surface of the collector.” (emphasis added). Therefore, Bryner itself describes that the process and apparatus disclosed therein, both employing an applied electric field, yield dispersed polymer fibers or webs, not oriented fibers. In fact, none of the references cited by the Office Action, all of which employ an applied electric field, result in an apparatus or method capable of producing aligned fibers, bespeaking of the indicia of unobviousness.

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In contrast, the method and apparatus of the instant claims entail applying a source of electric potential directly to the polymer dispersion inside the dispenser in order to charge the polymer dispersion before it is dispensed (see e.g., at paragraphs [0035]-[0036], [0042], [0046] and [0051]). An opposing charge applied to the electrode then draws the charged polymer dispersion, thereby creating a “liquid column motion” (page 8, paragraph [0037] of the originally filed specification), followed by the formation of a polymer jet stream.

Bryner does not disclose a charged *polymer* and an oppositely charged electrode, only a charged spinneret. As such, Bryner does not provide motivation or suggestion to configure a source of electrical potential such that it contacts the polymer dispersion in the spinneret in order to charge the polymer dispersion. Furthermore, there are no examples or guidance in Bryner that show how charged electrodes could be useful with polymer dispersions as the examples of Bryner describe only grounded electrodes (Examples 1-3, page 3 of Bryner). Thus, there is no suggestion or motivation, either in Bryner or in the knowledge generally available to one of ordinary skill, to modify the apparatus or the method (source of electrical potential inside the reservoir, which serves to charge a polymer and oppositely charged electrodes to pull the charged polymer) of Bryner in order to arrive at the apparatus and method of the instant claims.

Applicants respectfully traverse the rejection of claims 3 and 17 under 35 U.S.C. §103(a) as allegedly obvious over Bryner et al. (U.S. Patent No. 7,585,451 B2; hereinafter “Bryner”) in view of Lee et al (U.S. Patent Application No. 2002/0122840 A1; hereinafter “Lee”).

In particular, the Office Action acknowledges (page 8) that Bryner is silent with regard to the source of electrostatic potential and supplies Lee alleging that “it would have been obvious to a person having ordinary skill in the art at the time of the invention to use a direct current battery as per Lee as the source of the electric potential in Bryner’s process.”

For the reasons discussed above, Applicants submit that there is no motivation or suggestion provided to the skilled artisan to modify the apparatus and method of Bryner.

Lee is irrelevant because this publication does not disclose or suggest the apparatus and method of the present claims. Instead, this document discloses an apparatus comprising a barrel

to contain polymer materials in the liquid state, a pump for pressurizing and supplying the polymer materials to a spinning part, which injects the polymer materials in the liquid state through charged nozzles onto a collector. The method of Lee for fabricating polymer webs entails charging the polymer materials after they have been discharged through the nozzles (see Lee, page 1, paragraph [0016] and Figure 1a). Thus Lee does not provide motivation or suggestion to the skilled artisan for modifying Bryner in such a way as to arrive at the method or the apparatus of the instant claims. Applicants respectfully request reconsideration and withdrawal of the rejection.

Applicants respectfully traverse the rejection of claim 12 under 35 U.S.C. §103(a) as allegedly obvious over Bryner et al. (U.S. Patent No. 7,585,451 B2; hereinafter "Bryner") as applied to claim 1, and in view of Childs et al. (U.S. Patent No. 2,338,570; hereinafter "Childs").

The Office Action acknowledges that Bryner is silent with regard to appropriate materials for construction of spinnerets and turns to Childs to cure the deficiency.

As discussed above, Bryner does not disclose or suggest an apparatus with an electrical potential source configured in such way as to make contact with and charge a polymer dispersion prior to it being dispensed. Moreover, Bryner does not show how charged electrodes could be useful with polymer dispersions. Therefore, there is no suggestion or motivation provided by Bryner to modify the apparatus disclosed therein in order to arrive at the apparatus of the instant claims.

Childs discloses an electrospinning apparatus comprising a tank from which spinning solution is conducted via a conduit, valve, and meter pump to a candle filter and finally to a spinneret (see Figure 1 and page 2, lines 64-69). Applicants submit that Childs is silent with regard to the placement of an electric potential inside a dispenser in order to make contact with a polymer dispersion contained therein. Childs discloses on page 2, lines 35-49 that the source of potential is connected to a metallic pipe (15, in Figure 1) and to an electrode (16, in Figure 1) "in a side wall of the cabinet below and on the opposite side from the spinneret." The combination of Bryner and Childs fails to teach or suggest all of the recited claim limitations of the instant application. Nor would a skilled artisan be motivated by the disclosure of Childs, or based on

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their own knowledge, to modify the apparatus of Bryner in order to arrive at the apparatus of the present claims. Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejection.

Applicants respectfully traverse the rejection of claims 21-26 under 35 U.S.C. §103(a) as allegedly obvious over Bryner et al. (U.S. Patent No. 7,585,451 B2; hereinafter “Bryner”) as applied to claim 18 in view of Chu et al (U.S. Patent Application No. 2003/0054035).

In particular, the Office Action alleges that Bryner “teaches the general method as applied above but is silent regarding pre-dissolution of the polymer; the identity of the polymer; and whether the metastable dispersion further comprises a compound to decrease its stability (pages 10-11). The Office Action asserts, with regard to claims 21-26, that Chu discloses pre-dissolving material prior to adding to a larger liquid phase; poly(lactic acid-co-glycolic acid) as the polymeric material; and an additive for the metastable dispersion, wherein the additive is sodium chloride. The Action concludes that it would have been obvious to the skilled artisan to modify the disclosure of Bryner in view of Chu to arrive at the method of the present claims. Applicants respectfully disagree.

Applicants have shown above that Bryner discloses a method ideally suited to the production of a fibrous web of polymers, where the polymer fibers are randomly oriented and not a method for producing three-dimensionally aligned polymer fibers. As discussed above, Bryner does not suggest or provide motivation to pre-charge the polymer dispersion nor does Bryner describe how charged electrodes would be useful with the polymer dispersion. As such, Bryner does not provide motivation to the skilled artisan to modify the method disclosed therein in order to arrive at the method of the instant claims.

Chu does not cure the deficiency of Bryner, rather this document describes the process of electrospinning (at page 2, paragraph [0012]), which in principle entails imparting an electrical charge on the free surface of a droplet containing polymeric material *after* it is discharged from a nozzle. In contrast, the presently claimed method for fabricating oriented polymers requires that that the polymeric material is charged *prior* to leaving a dispenser. Charging the dispersion while it is contained in the dispenser is critical to the method as claimed, given that the electrode

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placed in proximity to the orifice of the apparatus is oppositely charged, thereby resulting in an electrostatic attraction between the electrode and the dispersion. Chu, like Bryner, relies on a process for fabrication of a fibrous matrix (see page 2, paragraph [0027] of Chu). Chu does not disclose first charging a dispersion of polymeric material and charging an electrode with an opposite charge to that of the dispersion thus, Chu does not cure the deficiency of Bryner. As such, the combination of Bryner and Chu fails to teach each and every limitation of the instant claims. The skilled artisan would not be motivated by the disclosure of Chu, or in view of their own general knowledge, to modify Bryner and arrive at the method recited in claim 18.

Accordingly, Applicants respectfully request withdrawal of the rejection as it applies to claim 18 and claims dependent therefrom.

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CONCLUSION

Applicants believe that the present application is now in condition for allowance. Favorable consideration of the application as amended is respectfully requested. The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

Applicants believe that no fee is deemed necessary with the filing of this paper. However, the Commissioner is hereby authorized to charge any fees that may be due in connection with the filing of this paper, or credit any overpayment to Deposit Account No. 07-1896.

Respectfully submitted,



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